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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/815,914	03/22/2001	Yumin Liu	10460-013-999	7459

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EXAMINER
NGUYEN, TAM M

ART UNIT	PAPER NUMBER
1764	8

DATE MAILED: 04/09/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/815,914	Applicant(s) LIU, YUMIN	
	Examiner Tam M. Nguyen	Art Unit 1764	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *22 March 2001* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-15 and 67* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-15 and 67* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2 .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970);and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1-15 and 67 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-55 of U.S. Patent No. 6,355,854 ('854). Although the conflicting claims are not identical, they are not patentably distinct from each other because the process of claims 1-55 of Patent '854 is the same as the process of claims 1-15 and 67 of the present application. The process of claims 1-55 of Patent '854 does not specifically disclose the selectivity and the conversion of the dehydrogenation process. However, it would be expected that the process of claims 1-55 of Patent '854 would have the same results (conversions and selectivity) as the results of the process of claims 1-15 and 67 of the present application because the process of claims 1-55 of Patent '854 uses the same feedstock and catalyst as the feedstock and catalyst of the process of claims 1-15 and 67 of the present application.

Claims 1-15 and 67 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-39, 41-44, 46-77, 74, 78,79,81-88, and 99 of copending Application No. 09/510,458. Although the conflicting claims are not identical, they are not patentably distinct from each other because both claimed processes of the present application and application 09/510,458 disclose a dehydrogenation of alkane to alkene. The claimed process of application 09/510,458 does not specifically disclose the selectivity and the conversion of the dehydrogenation process. However, it would be expected that the process of claims 1-39, 41-44, 46-77, 74, 78, 79, 81-88, and 99 of application 09/510,458 would have the same results (conversions and selectivity) as the results of the process of claims 1-15 and 67 of the present application because the claimed process of application 09/510,458 uses the same feedstock and catalyst as the feedstock and catalyst of the process of claims 1-15 and 67 of the present application.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Claim Objections

Claims 1 and 67 are objected to because of the following informalities: the expression "about 50% nickel oxide" in lines 2 and 3 of claims 1 and 67, respectively, is missing a unit. Appropriate correction is required.

Claim Rejections - 35 U.S.C. §112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-15 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for a dehydrogenation process having selectivity of greater than 70% and a conversion of greater than 10% by using a catalyst having a **specific composition** of Ni, Nb, Ta, K and Co at a **specific operating temperature**, does not reasonably provide enablement for a dehydrogenation process having selectivity of greater than 70% and a conversion of greater than 10% by using a catalyst containing **nickel oxide** at a non specific **operating temperature.** The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to use the invention commensurate in scope with these claims.

The scope of each of claims 1-15 includes the selectivity of greater than 70%, 75%, 80%, or 85% and the conversion of greater than 10% or 15% but the process of claims 1-15 does not include the effective operating temperature and the composition of each metal oxide in a catalyst that gives the selectivity of greater 70%, 75%, 80%, or 85% and the conversion of greater than 10% or 15%. Therefore, the entire scope of each of the claims is not enabled by the specification.

Claims 1-5 and 67 are rejected under 35 U.S.C. 112, first paragraph, as based on a disclosure which is not enabling. Oxygen which is critical or essential to the practice of the invention, but not included in the claim(s) is not enabled by the disclosure. See *In re Mayhew*, 527 F.2d 1229, 188 USPQ 356 (CCPA 1976). The claimed process has to be operated in the presence of oxygen to convert alkanes to alkenes as claimed.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-15 and 67 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The expression "at least **about** 50 % nickel oxide" in lines 2 and 3 of claims 1 and 67, renders the claims indefinite because the expression includes values above and below 50%.

The expressions (NiO), (Nb_2O_5), and (Ta_2O_5) in claim 67, render the claim indefinite because it is unclear whether the limitation(s) in the parentheses are part of the claimed invention. The examiner suggests that the expressions should be rewritten as --,NiO,--, --,Nb_2O_5,--, and --,Ta_2O_5,--, respectively.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 6-8, and 10 are rejected under 35 U.S.C. 102(b) as being anticipated by McCain (4,524,236).

McCain discloses an oxidative dehydrogenation process of ethane to produce ethylene by contacting the ethane feed with a catalyst comprising nickel oxide at a temperature less than or equal to 400^0 C. The process is performed at a conversion of 70% and a selectivity greater than 80 %. (See col. 2, line 64 through col. 3, line 13; tables I and II)

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 148 USPQ 459, that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or unobviousness.

Claims 1-5, 11-13, and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ji et al. "Effect of group VIII elements on the behavior of Li/CaO catalyst in the oxidative dehydrogenation of ethane," React, Kinet. Catal., Vol. 62, No. 1, 121-128, 1997.

Ji discloses an oxidative dehydrogenation process to convert ethane to ethylene by contacting ethane, in the presence of oxygen, with a catalyst comprising nickel oxide. The selectivity and the conversion of the process are greater than 85% and 15%, respectively. (See pages 123-126).

Ji does not specifically disclose that the catalyst comprises at least 50% of nickel oxide. However, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the Ji process by utilizing a catalyst that comprises at least 50% of nickel oxide because it is known in the art that a catalyst comprising nickel oxide is

effective in an oxidative dehydrogenation process to convert ethane to ethylene. Therefore, one having ordinary skill in the art would utilize any effective amount of nickel in the Ji catalyst and it would be expected that the results would be the same or similar when using a catalyst which contains at least 50% of nickel oxide as the claimed catalyst in the process of Ji.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tam M. Nguyen whose telephone number is (703) 305-7715. The examiner can normally be reached on Monday through Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marian Knode can be reached on 703-308-4311. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 305-5408 for regular communications and (703) 305-7718 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

Tam Nguyen/ TN
April 5, 2002

Walter D. Griffin
Primary Examiner